interest him concerning pearls, cameos and oysters. The nomenclature has been, in the main, brought up to date, the trumpet-shell figuring as *Lotorium variegatum* in place of the familiar *Triton tritonis*, while *Scala*, instead of *Scalaria*, stands for the precious wentletrap.

A Text-book of Astronomy. By Prof. George C. Comstock. Pp. viii+391. (New York and London: D. Appleton and Co., 1901.) Price 7*s.* 6*d.* net.

IT is an excellent sign that among recent works dealing with astronomy there have been some in which methods of teaching the elementary parts of the subject have formed a notable feature. The book under notice is to be regarded as one of this class, as the author, a well-known American astronomer, has endeavoured to "concentrate attention upon those parts of the subject that possess special educational value." The importance of observations with simple appliances is strongly insisted upon in the preface, but from this point of view the book is distinctly disappointing. It is true that in the earlier chapters an attempt is made to introduce practical exercises, some of them observational and others involving the construction or study of drawings; but this admirable beginning is by no means consistently followed up. In fact, the greater part of the book does not strike us as being other than a general outline of the chief facts and principles of astronomy suitable for ordinary reading, except that at intervals the reader is expected to pause and answer a question, such as "What is the magnitude (of Algol) 43 days after a minimum?" The practical method, however, might well have been further adopted; a telescope of adequate power for the demonstration of many phenomena, such as the sun's rotation, can be cheaply and easily constructed, and graphical exercises might have been more frequently introduced with advantage. We notice, also, that the use of a globe in illustrating celestial motions is not mentioned at all. Nevertheless, so far as it goes, the practical work described will be of great value to students, and will doubtless encourage them to further efforts in the same direction.

The book touches upon nearly every branch of astronomy, and the explanations and descriptions are both concise and clear. The numerous illustrations have been selected and reproduced with great care, and, as the author remarks, are worthy of as careful a study as the text; the diagram on p. 153, illustrating the path of the moon with respect to the sun, deserves special mention.

An Introduction to the Practical Use of Logarithms. By F. G. Taylor, M.A., B.Sc. Pp. vi + 63. (London: Longmans, Green & Co., 1901.) Price 1*s.* 6*d.*

THERE can be little doubt that much time is lost by students and others who have occasion to make numerical calculations through unfamiliarity with the practical advantages of logarithms. In the present little book, however, by the consistent employment of the simplest arithmetical illustrations, the author goes far to remove the mystery in which, to many students, the subject appears to be involved by fuller theoretical treatment. The explanations are clear throughout, and these, together with the numerous carefully selected examples, should enable a student of ordinary intelligence to quickly master the use of logarithmic tables. The tables themselves occupy but six pages, two for logarithms, two for reciprocals and two for anti-logarithms. A chapter on methods of rough calculation, intended to verify the results obtained by the use of logarithms, forms a valuable addition to the book. The general subject is excellently illustrated by the application to problems in mensuration, and the whole is brought well within the range of students who have no knowledge of algebra.

LETTER TO THE EDITOR.

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The Moon and Wet Days.

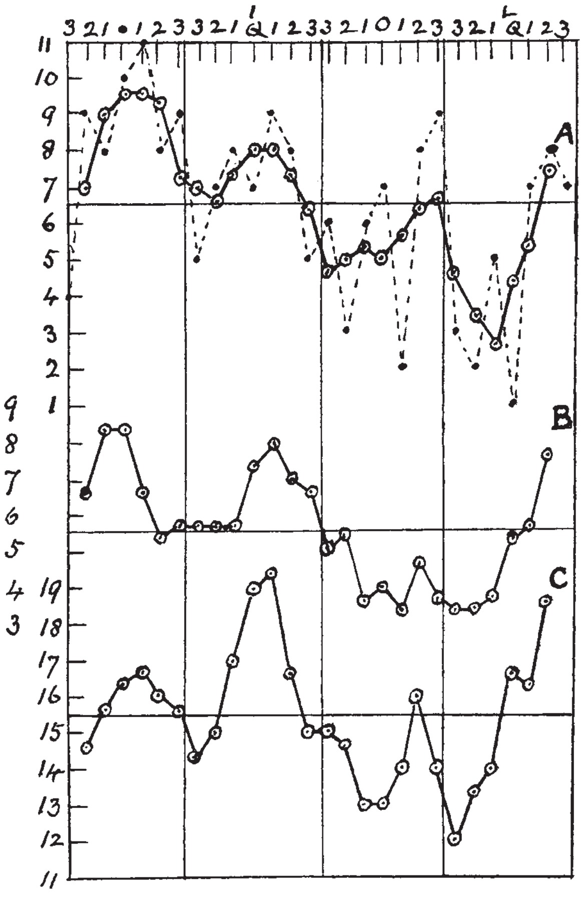
THOUGH it is counted heresy in some quarters to associate weather with the moon, the following results of a recent inquiry into the subject, whether held to be proof of lunar influence or not, might, I think, be of interest to many.

The period considered is the last 24 years. The data (which are for Greenwich) are these:—

(A) Days with ·5 in. of rain, or more, *in the year.*

(B) Days with ·4 in., or more, *in the summer half* (April to September).

(C) Days with ·2 in., or more, in the summer half.



The method in each case was first to ascertain the distribution in seven days about each of the four lunar phases (*i.e.* how often each of those 28 days had rain amounting, *e.g.*, to ·5 in., or more), then smooth the series with averages of *three.*

Both smoothed and unsmoothed curves are given in the case of A; but only the smoothed curves for B and C.

From the fact that four weeks does not quite cover the time of a synodical revolution of the moon (which is about 29½ days), there are a few wet days in each class not coming under any of the above categories. These may perhaps, with regard to the purpose of the inquiry, be left out of account. The totals dealt with are: A, 182 days; B, 158; and C, 433. These come short of the actual totals by A, 7 days; B, 8; C, 28.

Turning now to the curves, the recurrence of four long waves in the smoothed curve for A (less pronounced in C and B), may be noted, in passing, as a remarkable feature.

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All the smoothed curves agree in presenting a minimum between the full moon and the last quarter (the third, second, or first day before last quarter). As to the maximum, it is about new moon in A and B, the first quarter being not much below; but in C the first quarter comes into prominence.

The salient facts of A might be put in this way. If all the wet days (182) were uniformly distributed throughout the four weeks, each group of three days would have about 20 cases of that degree of wetness (·5 in. or more). Now the lowest group (about the day before last quarter) has 8, and the highest (say about new moon) has 29, or nearly four times as many. The corresponding numbers for B are: av. 17, min. 10, max. 25; and for C, av. 46, min. 36, max. 58. The contrast becomes less marked as we lower the limit.

Individual days have some interesting features. Thus the third day before the last quarter has never, in these 24 years (summer half) had as much as ·4 in. of rain; and last quarter day has had such only once.

The data of Class A were further dealt with in this way. The odd years were treated as one group, and the even years as another. Both agreed in giving a minimum between full moon and last quarter. The maxima were about new moon in one case, and about first quarter in another.

In view of the present position of the moon-and-weather question, I content myself with merely giving these facts and inviting criticism.

It might happen that another 24 years would obliterate those distinctions, putting others in their place. Should the same relations continue in future, it would appear that in the few days before last quarter we have the best chance of escaping days which would be considered thoroughly wet.

ALEX. B. MACDOWALL.

NORTH AMERICAN FOLKLORE.[1]

ALTHOUGH the habits and surroundings of the American Indians are undergoing a gradual change through the advance of western civilisation, and their original conditions of life are disappearing, yet, thanks to American enterprise in the fields of archæology and folklore, the records of such things are being faithfully kept that they may not entirely die out or become vague tradition. It is with this object that two valuable papers on Arizona have been published in Part 2 of the "Seventeenth Annual Report of the Bureau of American Ethnology," the first dealing with the Navaho *hogáns* or houses, and the second giving an account of excavations in Arizona in 1895. The former, by Mr. Cosmos Mindeleff, contains, not only his material, but also much of the late A. M. Stephen, who lived for many years among the Navaho. The Navaho Indians now occupy a reservation of more than eleven thousand square miles in the north-eastern part of Arizona and north-western corner of New Mexico, the whole tract lying within the plateau region, and under modern conditions they are slowly developing into an agricultural tribe, although they still retain their pastoral habits. It is with the curious customs relating to the building of *hogáns* or houses by this people that the author has concerned himself, and he has elicited many interesting facts about them. The Navaho are accustomed to build two kinds of *hogán*, one for the winter and one for the summer; the former resemble mere mounds of earth hollowed out, yet they are comfortable and excellent for their purpose, and although they are of rough appearance their builders conform, not only to custom, but even to what amounts almost to ritual in their construction, with inaugural ceremonies of the most elaborate description. There is no attempt at decoration; a framework is formed of interlocked forked timbers, to which are added stout poles for the sides, and the whole is covered with bark and earth. Usually a *hogán* can be finished with the help of the neighbours in one day, and in the same evening begins the dedication. The goodwife sweeps and garners the new house, while a fire is kindled inside directly under the smoke hole. The head of the family then comes in and, after rubbing a handful of dry meal on the five principal timbers and strewing some on the floor, begins to chant the following:—

> "May my house be delightful,
> From my head may it be delightful,
> To my feet may it be delightful,
> Where I lie may it be delightful,"

and so on. The Navaho have a tradition that they were taught hut-building by the God of Dawn, while to the tribes of the plain were given skin lodges, and to the Pueblo stone houses. Long ago, when First-man and First-woman were living in the lowest Underworld, their dwelling was the prototype of the present *hogán*, and some say that instead of a covering of bark and earth its poles were wrapped in a film of sunbeams and rainbows. This Underworld was peopled by monsters who also lived in huts built after the same fashion, but of different materials. In the east dwelt *Tiéholtsodi* in a house of cloud, with Thunder guarding his door, while in the south sat the Frog in a dwelling of blue mist. The western mirage afforded a home to the Salt-woman, before whose door the Water-sprinkler dances, and towards the north the Blue Heron built himself a *hogán* of green weed with the Tortoise as his gate-porter. When mankind had ascended to the present or fourth world by the power of the Magic Reed, the kindly Dawn God taught them the methods of building that were best fitted for their several conditions. The *hogán* is but a temporary habitation, as is obvious from the following Navaho custom: When an Indian dies within a house, the beams are pulled down over the corpse while the remainder is usually set on fire, and the ruin then becomes *tabu* to the tribe for a long time to come.

The second and larger part of the volume is an account of the excavations which were carried on in 1895 by Dr. Walter Fewkes among the ruined pueblos and dwellings of Arizona. His object was to examine the ruins in the valley of the Rio Verde and the neighbourhood, as well as various other ruins, in order to solve certain problems connected with American archæology. The Moki or Hopi Indians, who now inhabit the limited area called Tusayan, claim to be descended from the pristine inhabitants of its ancient villages, and Mr. Fewkes was well fitted to conduct such investigations, having spent several summers previously among these tribes.

The ruined dwellings of the Rio Verde may be classified into three divisions. First, the pueblos, or independent habitations, that is to say those dwelling-places, ancient or modern, which are isolated on all sides from cliffs. Secondly come the cliff houses, with some part of their walls formed by the natural rock as it stands; and thirdly we find the cavate dwellings, where the rooms are excavated from the cliff wall. Dr. Fewkes carefully examined the latter class, of which so many exist on the left bank of the Rio Verde, and he considers that this side of the river in ancient times must have swarmed with people. In many of the chambers the fireplace was easily discovered, and many more had their ceilings blackened with smoke. In the neighbourhood were a few pictographs on rocks very similar to those found in Colorado, Utah and New Mexico.

Among his other explorations, Dr. Fewkes excavated part of the ruin of Awatobi, which is the connecting link between the prehistoric civilisation of Sikyatki and modern Tusayan life. It was one of the largest Tusayan pueblos in the middle of the sixteenth century, and notices of its mission occur in contemporary documents. We

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[1] "The Annual Report of the Bureau of American Ethnology." J. W. Powell, Director, Washington. (Seventeenth, Part 2. 1898, pp. 277; Eighteenth, Part 1, 1899, pp. lvii+518.

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